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LETTERS TO THE EDITOR

Historical Perspective on Holter Monitoring

As a staff member at the Holter Research Foundation in Helena, Montana from 1948 to 1968, I need to add something to the article in JACC's January 1991 Historical Milestones section entitled "Historical Vignette Celebrating the 30th Anniversary of Diagnostic Ambulatory Electrocardiographic Monitoring and Data Reduction Systems."

Doctors know the importance of reading labels, so I'll try to make my point easy to remember. For future reference, picture a huge red-lettered stamp across pages 286–292 of that issue stating: "*Warning to Serious Students of Holter Monitoring: This Article May Be Hazardous to Your Sense of Historical Perspective.*"

From the beginning abstract's erroneous premise that the monitoring device was conceived exclusively to identify insufficiency states to the end credits indicating that Mrs. N.J. (Joan) Holter and I collaborated substantially with the author, the article is factually faulty.

For instance, the report of early 1950s discussions with Dr. Paul Dudley White at the Holter Research Foundation laboratory about "attempts to transmit ECG and electroencephalographic signals from space back to earth" is pure fiction; and, more important, so are Dr. Eliot Corday's claims of having "worked closely . . . during the formative years" of the development of the monitor.

A couple of pertinent facts, for the record: 1) the first account of the Holter Research Foundation's work on an ambulatory monitoring device was published in 1949 (a fact tucked away only as footnote 6), about a decade before Dr. Corday and Norman Jeffers (**"Jeff" Holter** even became acquainted; 2) Dr. Corday's first use of the monitor did not take place until 1962, when I personally demonstrated the system—using the same prototype that was being released for commercial production under an already negotiated agreement—to him while I was in Los Angeles on related business.

Dr. Corday, along with several other cardiologists around the country, did participate in clinical application of the manufactured units and subsequently published results in the mid 1960s, for which we were grateful. As for any earlier "contributions" he imagines within the convoluted chronology he has constructed and as for his general characterization of Jeff's reliance on him for critical advice on the monitor's features or future, I have an analysis of Dr. Corday's article detailing several discrepancies that I would be pleased to share with anyone on request. Also, the archives at the Montana Historical Society thoroughly document our work at the Holter Research Foundation.

In summary, several aspects of the referenced January 1991 article are invalid and I do not recommend it as a reliable historical source on the development of the Holter monitor

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Reference

1. Corday E. Historical vignette celebrating the 30th anniversary of diagnostic ambulatory electrocardiographic monitoring and data reduction systems. J Am Coll Cardiol 1991; 17:286–92.

Reply

Glasscock states: "From the beginning abstract's erroneous premise that the monitoring device was conceived exclusively to identify insufficiency states . . . the article is factually faulty." *Answer:* Glasscock is wrong. On pages 289–290 of the historical vignette I stated seven potential uses of our ambulatory monitor (items 1 to 7) under the heading, "Proposed Clinical Potentials for the Expanded Applications of Ambulatory ECG Monitoring." I stand by my views based on 31 years of experience in clinical and experimental studies that the value of the Holter monitor lies principally in its detection of puzzling "silent," "phantom" or "evanescent" cardiovascular, gastrointestinal, locomotor cerebral events and assay of the effectiveness of cardiac drugs or clinical interventions.

Glasscock states: ". . . to the end credits indicating that Mrs. N.J. (Joan) Holter and I collaborated substantially with the author, the article is factually faulty." *Answer:* Glasscock is wrong. I never used the words "collaborated *substantially*" in my acknowledgment. I merely thanked Joan Holter for "providing me with documentation and anecdotal information . . ." Likewise, I thanked Glasscock for *his time in searching the files at the Montana* Historical Society. Although he did not come up with any information except for the date of his visit to my laboratory in Los Angeles, I thought I should thank him for his time and effort.

Glasscock calls "pure fiction" my claims of having worked closely during the formative years of the development of the monitor. Extensive correspondence between Holter and me beginning in 1960 documents Holter's reliance on my advice for what was then called the Electrocardiocorder. Holter's letters also document Holter's proposals for collaborating with me, and verify that at my urging Holter named the recorder "the Holter monitor." The correspondence also verifies that I brought Jeff Holter together with Bruce Del Mar and convinced Jeff that Del Mar Avionics should manufacture the monitor. If anyone wishes to check these facts, copies of this correspondence are available at my office.

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ISIS-3

The preliminary results of the Third International Study of Infarct Survival (ISIS-3) showed a higher incidence of intracranial hemorrhage in the group treated with duteplase, recombinant tissue plasminogen activator (Burroughs Wellcome's rt-PA): (0.7%) compared with the streptokinase group: 0.3% (1). In contrast, other studies, which used Alteplase (Genentech's rt-PA), such as "TIMI-2" (2) and "GISSI-2" (3), reported a lower rate of intracranial hemorrhage (0.5% and 0.4%, respectively) than the rt-PA arm of the ISIS-3 clinical trial.

A possible cause for the discrepancy may lie with a methodologic

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